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New England Business

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Part I, Early History

Investment Banking in New England

The investment banker is the middleman between the user of investment funds and the saver supplying the funds. He provides specialized services for corporations and state and local governments. He may begin by advising a corporation on financing and recommending that it issue a particular type of stock or bond. The banker may then buy the entire issue at a negotiated price. Or, in the case of public utility and state and local bond issues, he may bid in competition with other investment bankers on a bond issue which he has not helped prepare.

The investment banker seldom holds a security issue for any length of time. Rather, he sells the securities to individuals and other institutional buyers who are looking for an investment outlet. His compensation – which varies – is the difference between purchase and sale prices of securities, and represents in part profit for the bearing of risk and in part compensation for the work performed in "originating the issue" and concluding the sale. Investment bankers will be found in some communities with a population as small as 25,000, but are mainly concentrated in the larger cities particularly New York, Chicago, Boston, San Francisco and Philadelphia.

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Investment Banking and Economic Development

Early in human history it was discovered that if part of production were used for tools instead of consumption, total production could be increased so much that the portion left for consumption was also increased. Today only 15 percent of the national product goes for the tools of production. However, that 15 percent is important in the nation's economic growth and strength.

Before the industrial revolution there was little problem in arranging for investments. The predominant activity was agriculture, and each farmer was able to divide his time and the efforts of additional workers between production for consumption and production for investment. A similar situation existed with respect to the small, family-owned shops – the factories of that period.

With the rise of trade and traders, especially those who were seagoing, horizons broadened. Opportunities for gains from trade led to efforts to collect capital in the form of ships and inventories. This often required a larger amount of capital than could be supplied by a single individual or family. Trade led to specialization and specialization led to larger shops and factories. The expansion of manufacturing and trade led to needs for investment funds by industrial and commercial concerns which exceeded the amounts that could be supplied by a single owner or family. In addition, more governmental facilities such as roads, canals, harbors, and railroads were needed, which required financing assistance from the general public.

With the broadening of trade, the expansion of manufacturing, the growth of public facilities and the decline of the largely self-sufficient farm, a greater share of the population shifted from the direct ownership class to the employee class. The employee had little opportunity to save by direct investment but the need for saving was as urgent as ever. The pressure arose for indirect saving – saving by lending to financial intermediaries who would do the real investing.

Merchant Financiers

The forerunners of investment bankers were merchants. The most important business activity in the early part of the 19th century in America, as elsewhere, was foreign trade and shipping. Well-known general merchants of that day included Thomas H. Perkins of Boston, John Jacob Astor of New York, Stephen Girard of Philadelphia, and George Peabody of Baltimore.

The general merchant was a trader, commission merchant, warehouseman, carrier, banker, and sometimes a manufacturer. As the nation developed and business activity spread inland, the merchants began to specialize. Some remained in foreign or domestic trade, while others turned to manufacturing or financing.

The trend was illustrated by three famous New England merchants who engaged in the China trade – John Perkins Cushing, John Bryant and William Sturgis. When they retired from the foreign trade field, the latter two formed Bryant, Sturgis and Company, a general banking firm. Cushing placed his funds with the new firm to earn interest and to be placed directly in investments. The funds the firm managed were first invested primarily in New England, but gradually they were placed in other eastern states and in the expanding West.

Beginnings of Investment Banking

One of the early roles of financial intermediaries was the selling of lottery tickets. Private ventures, as well as nonprofit and charitable projects, used lotteries as a means of financing. The purchaser of a ticket gambled on receiving a prize, the sponsor secured capital and the salesman received a percentage of the proceeds as a commission. Among the lotteries conducted in 1812 were those sponsored by Harvard College and Union College.

The history of S. and M. Allen and Company, established in 1815 in New York, illustrates the early development of the role of financial intermediaries. This company established partnership branches in various cities, including Boston, Providence and Portland. Their chief operation at first consisted of selling lottery tickets, but after 1820 they began to shift to securities. They also dealt in bank notes and commercial paper and carried on a foreign exchange business. The Allen partnerships were dissolved in 1837, but many of the former branch partners continued operations in the financial field.

The financial houses of that period usually combined the activities of investment and commercial banking. In addition to engaging in the usual short-term commercial lending, they made long-term loans to business ventures which were in reality investment funds.

Stock exchanges were organized early in American history – in New York and Philadelphia by 1800, and in Boston in 1834 where, however, public trading in stocks was recorded at least as early as 1803. They scarcely resembled the present form of these exchanges which have wide

This article is the first of a series adapted from the 1960 Annual Report of the Federal Reserve Bank of Boston, entitled "Investment Banking in New England." This Annual Report may be secured from the bank's public relations department.

contacts and are well known to the public, but they did help create an awareness of a new source of funds and investment opportunities.

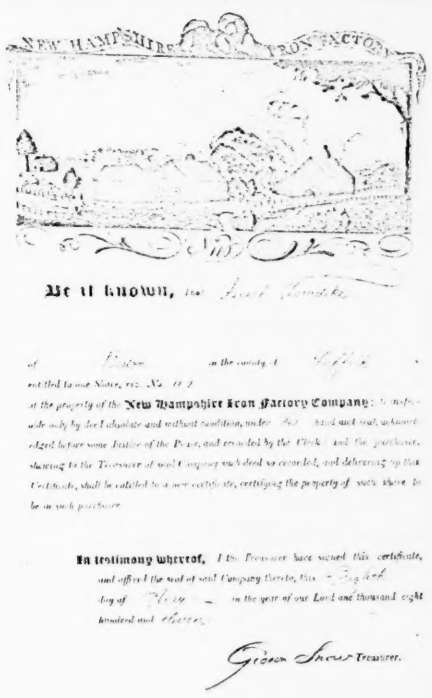
State and Local Securities

Debts of the individual states were assumed by the Federal Government in 1790, and from then until about 1830 little state debt was outstanding. By 1830, however, demands grew for the states to improve transportation systems. There was also pressure for state aid in setting up banks. By 1841, total state and local debt had reached about $260 million, with two-thirds of the proceeds used to construct turnpikes, bridges, canals, and the new railroads, and most of the remainder used to capitalize banks.

The New England states' reliance on bonds was relatively less than that of the rest of the country. While New England's population made up about one-quarter that of the nation, their state and local debt was only about 4 percent of the total for all states.

Railroad construction began to accelerate after 1840 and financial aid was granted by both states and cities. This aid consisted of outright cash grants, gifts of state securities, and the exchange of state securities for railroad securities. Railroads receiving state securities as exchanges or gifts had the job of selling these issues to obtain construction monies. For this purpose they hired the financial houses and brokers which were coming into existence.

Banks were a major market for state and local securities. Not only had they been capitalized by state funds in many cases, but they were also required to hold state and local securities as a reserve for their note issues, which comprised most of the paper money of that period. Banks also began to sell state and municipal securities as these governmental units sold greater amounts than the banks could absorb.



NEW HAMPSHIRE IRON FACTORY

Be it known, that

of in the county of

entitled to one Share, viz. No.

at the property of the **New Hampshire Iron Factory Company**: to be transferred only by the Proprietor and without condition, unless

signed and sealed, acknowledged before some Justice of the Peace, and recorded by the Clerk; and the purchaser, shewing to the Treasurer of said Company such deed so recorded, and delivering up this Certificate, shall be entitled to a new certificate, certifying the property of such share to be in such purchaser.

In testimony whereof, I the Treasurer have signed this certificate, and affixed the seal of said Company thereto, this

day of in the year of our Lord one thousand eight hundred and

Treasurer.

Financing the Textile Industry

The industrial revolution largely began with the invention and development of improved cotton manufacturing machinery in England during the middle decades of the 1700's. England guarded her mechanical inventions jealously and an early textile engineer, Samuel Slater, donned the disguise of a farmer so that he could emigrate to America to set up textile mills. Slater started his first mill in an old cloth fulling shop at Pawtucket Bridge in 1790. This was a small mill, or "Rhode Island" type, which involved only one process in cotton cloth manufacture, spinning.

A large cotton mill – the "Massachusetts" type—was set up outside Boston in Waltham on the Charles River by Francis Cabot Lowell in 1814. This plant was reputed to be the first fully integrated mill in the world; it combined all the operations in cotton cloth manufacture from preparation of the raw bale cotton to yarn spinning and final cloth weaving. Some of the original structures are still standing. A mill as large as this required a great deal of investment capital and capital stock subscriptions were obtained from relatives and close acquaintances.

Many more large textile corporations were chartered and by 1835 the Boston Stock Exchange listing included 15 textile stocks. Ten years later the list had grown to over 30, with several textile machinery companies included. Textile stocks were not widely traded at midcentury, however. Par values were generally at $1,000 and most of the shares were closely held, usually appearing on the market only in the case of executor's sales. This contrasted with the active trading in bank, insurance and railroad stocks which usually had a par of $100.

Many financial institutions received their first experience as middlemen or intermediaries in equity financing with the textile industry. Insurance companies acquired stock as a permanent

part of their investment portfolio. Commercial and savings banks acquired stocks as collateral on loans and sometimes took title as a result of forfeited loans. Brokerage firms purchased for resale. As a group, however, institutional investors did not often buy new issues from the issuer. They subscribed to only about 2 percent of original issues but often made purchases in the secondary market. In this way, they served to free the funds of individuals who served as the primary market for new issues.

Individuals supplied the bulk of the equity funds for textiles manufacturing. Their subscriptions ranged from $2,500 to $200,000. Mercantile groups were the dominant suppliers of capital funds. Also important were bank officers, insurance company officials and brokers.

The record suggests that experience with these mills proved equity capital to be a sound means of financing large industrial developments. Individuals and financial institutions gained experience in purchasing and selling common stock.

What was particularly striking about this financing was the almost complete absence of foreign capital and the small amount obtained from other regions of this country. New England's textile industry was essentially locally financed. Indeed one of the reasons for New England's industrialization was the availability of capital. Until financial institutions grew up in other regions and the regional capital markets were linked together, economic growth in many parts of the country was held back by an inadequate supply of capital.

Thus, New England's early economic history demonstrated that a large industry could be financed without foreign assistance. Generally satisfactory results, both in safety and returns on capital, set the stage for the use of equity capital financing throughout the country.

Railroad Financing

The first railroad in this country, less than a mile in length, was built near Philadelphia in 1809, and probably the second, three miles in length, was constructed in Quincy, Massachusetts in 1827. Both were used for transporting quarry stone to the water's edge. The first general purpose railroad was opened by the Baltimore and Ohio in 1830 in Maryland.

After 1830 railroads sprang up all along the Eastern seaboard. The greatest expansion took place in the states south of New York. Bond financing predominated, with bonds issued either by the roads or by the states where construction was planned. Some bonds were sold in England, with Philadelphia serving as the financing center. This flurry of expansion and financing was shattered by the panic of 1837 and rail expansion in Pennsylvania and southward slowed to a crawl.

Rail promoters in New England suffered much less than those in the mid-Atlantic states during the panic because this region's financing had been far more self-reliant. Stock issues rather than bonds were used to a greater extent for securing private capital, and the bulk of the stock was sold in communities served by the roads. New England suffered less from the depression of 1837 than other regions and was the first to recover. As a result, railroad expansion spurted ahead, and between 1840 and 1850 the basic rail network of New England was put in place. The Boston and Albany line, completed in 1842, was the first important through route in the country.

Boston grew as a financial center during the decade of the forties. The financial success of New England's railroads brought the center of American railroad finance here. Railroads in the South and West, which had depended on Philadelphia and England for financial support, now turned to Boston. The two most important Pennsylvania roads, the Reading and the Philadelphia, Wilmington & Baltimore, were reorganized and refinanced with the aid of Boston capital. Such prominent New Englanders as David A. Neal, John E. Thayer, Nathan Appleton, and William Sturgis put funds into the Reading Railroad and by 1849 ownership control resided in Boston.

The railroads in New York state which Erastus Corning had promoted also turned to Boston for aid. Then in 1845, Corning joined with Thayer and J. M. Forbes in purchasing the Michigan Central from the state of Michigan. In 1853, the Michigan Central completed a line from Buffalo to Chicago to connect the midland to the east.

The importance of Boston finance to the railroads, combined with the active trading in bank and insurance stocks, established Boston as the leading financial center during the mid 1800's. Some 40 railroad stocks were traded on the Boston Stock Exchange in 1850, including the out-of-region roads of the Erie, the Michigan Central, the Long Island, the Philadelphia, Wilmington & Baltimore, and the Reading.

By the time of the Civil War, however, New York's commercial advantages of central location and ease of foreign, coastal, and inland shipping had made that city the leading financial market of the nation. The centralization of the nation's money and credit markets has proceeded there ever since. New England borrowers no longer have a comparative advantage in obtaining capital funds. Modern investment bankers operate from coast to coast. They transfer funds from the saving public to credit-worthy borrowers wherever they may be.

New England Construction—Up and Down

New England construction activity in 1960 fell short of the expectations held at the beginning of the year. The composite performance, however, is the net result of weakness in some categories of construction and strength in others. In comparison with the national picture, New England's performance was relatively unfavorable on an over-all basis, but decidedly better in certain categories.

Statistics compiled by F. W. Dodge Corporation indicate that the total value of 1960 contract awards in New England for all types of construction was 3.4 percent less than the corresponding record total for 1959. Nationally, the 1960 total slightly exceeded that for 1959.

Employment in the industry varies considerably with the season and with opportunities for outside work. With allowance for this seasonal factor, there was evidence of a declining trend in activity as the year progressed. Whereas January 1960 contract construction employment in the six states was 8 percent greater than a year earlier, by December it had fallen 5 percent below the year-earlier figure.

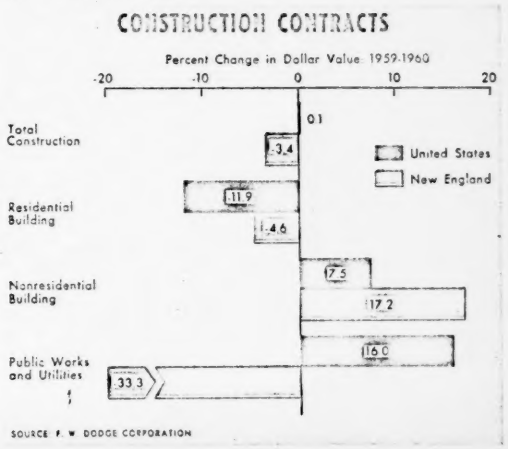
Analysis of trends by categories of construction aids a clearer understanding of where the strengths and weaknesses lie. Much of the weakness in New England's 1960 construction activity resulted from a sparsity of contracts for public works and utilities, which in aggregate were down 33 percent from the previous year. Otherwise New England performed relatively better than the nation. Her nonresidential building contracts were up 17 percent from 1959, in comparison with a 7 percent nationwide gain. Her 5 percent decline in residential contracts was relatively more favorable than the nationwide decline of 12 percent.

Much of the strength in the nonresidential category was derived from the momentum and fulfillment of building programs which had been formulated earlier when demand for goods and services seemed stronger and facilities less adequate. A survey made in the early spring indicated that New England manufacturers were then planning to spend 12 percent more in 1960 for new plant and equipment than they had spent in 1959. There was also evidence of an expanding flow of contracts for commercial, educational, social and other types of nonresidential buildings, both public and private.

Attention of business analysts and public officials, however, has become focused more upon the failure of residential construction to measure up to expectations. New housing activity was showing symptoms of boom growth in the first half of 1959. It then contracted with the rest of the economy during the long strike in the steel industry, but failed to make any subsequent recovery. During the first 11 months of 1960, the number of new housing units started in New England, New York, New Jersey and Pennsylvania was 16.5 percent less than in the similar period of 1959. The contracyclical strength which residential construction has sometimes displayed in periods of general cyclical contraction failed to assert itself this time. Factors of supply, demand and costs appear to have changed.

Housing starts in recent years have adequately met the rate of new family formation, to correct much of the earlier postwar shortage in the housing supply. The rental vacancy rate in the nine northeastern states rose from 3.5 percent in the final quarter of 1959 to 4.1 percent in the final quarter of 1960. Stocks of unsold new homes in some New England areas are accumulating. Builders and lenders in the region report a definite softening in demand for new homes, and for credit wherewith to finance their purchase.

While demand for mortgage funds eased during 1960, the supply of funds increased. New England mutual savings banks and savings and loan associations observed a change to an increasing rate of deposit inflow as the year progressed. Mortgage repayment schedules were generally met, despite some rise in delinquencies, and added to the supply of funds. Credit availability was ample to meet all local needs and to provide a surplus for investment in other regions where funds were scarcer and interest rates higher. In New England, interest rates ranging from 5½ to 6 percent on conventional type residential mortgages remained among the lowest in the nation.



Nuclear Energy in the Paper Industry

The glamour of nuclear energy has caused many persons to hope for a new industrial era in New England. The average New England utility and manufacturing plant pays about 50 percent more than the national average price for industrial fuel. If this competitive disadvantage were wiped out, new industries might be attracted to the region.

The fact seems to be, however, that nuclear energy will have little impact on New England's competitive position during the next decade. Utility officials doubt that electric power generated by nuclear reactors will be fully competitive for another five or ten years.

However, nuclear reactors are a definite possibility for large manufacturing plants using low temperature process steam. For example, the pulp and paper mills in northern New England, where fuel costs are 20 percent greater than in southern New England*, use great quantities of coal and oil; they operate 24 hours a day, seven days a week. Here, total cost per unit of output could be reduced by spreading the high overhead costs. As a result, the benefits of the low cost of nuclear fuel could be realized.

The cost comparison between nuclear and conventional steam production in the table is based upon private financing by a manufacturing firm. It is assumed that the average cost of capital (equity and debt financing) would be 15 percent, that a 7 percent per annum depreciation would be allowed, and that an amount equal to 3 percent of capital would be spent for business taxes and insurance. Thus the total "overhead" charge is 25 percent.

The table on this page clearly shows that with present day technology, private financing by a manufacturing firm and a nuclear reactor operating 80 percent of the year, process steam cannot now be produced economically by a nuclear plant. Overhead costs per megawatt of both the 20 and 40 megawatt reactors are clearly prohibitive. Only in the case of the 100 megawatt reactor are costs per unit of output low enough to be almost competitive.

However, a 100 megawatt reactor is much too large for any of the pulp and paper mills in New England. A plant processing 250 tons of pulp per day would require a reactor of 20 megawatt capacity, while one processing 1200 tons per day would use a 100 megawatt reactor. In New England a maximum of 10 such firms are large enough to utilize a 20 megawatt plant while only five could operate with a 40 megawatt reactor.

One of the major stumbling blocks for a nuclear reactor is the capital cost. Advances in technology may reduce construction costs, but this is not likely in the near future. It is possible, however, that the Federal government may wish to promote the development of nuclear technology by guaranteeing or granting direct loans for industrial reactors.

If the cost of money were reduced from 15 percent to 5 percent per annum and the optimistic assumption were made that the plant would operate 90 percent of the year, a nuclear reactor might well be competitive with a conventional steam boiler financed with private capital.

Thus, if the Federal government wished to further the development of nuclear energy by subsidizing the construction of a number of full scale industrial reactors, it could probably accomplish this at a lesser cost in northern New England than in almost any other part of the country.

This article is based largely on a report entitled *Nuclear Process Heat and the Paper Industry* written by Mr. Arun Joshi with the aid of a grant from the Federal Reserve Bank of Boston. Mr. Joshi is a former graduate student at the Massachusetts Institute of Technology. Single copies of the complete report can be obtained from the bank's research department.

* See: "Industrial Fuel Costs in New England," Part I, in the August 1957 *New England Business Review*.

COMPARATIVE COSTS OF NUCLEAR PROCESS STEAM AND CONVENTIONAL BOILER STEAM

Reactor Size	Reactor Type	Total Direct Construction Costs (1) ($000)	Costs in cents/million B.T.U.				
			Overhead Charges	Operating Costs (2)	Fuel Costs	Fuel Inventory Costs (3)	Total Costs
20 Megawatts	P.W.R.	—	160	39	21	—	220
	B.W.R.	1,130-1,940	92	31	28	18	169
40 Megawatts	P.W.R.	2,486-2,763	72	17	20	13	122
	B.W.R.	2,226	64	17	28	36	145
100 Megawatts	P.W.R.	—	72	12	29	—	113
	B.W.R.	22,000	35	12	32	36	115
10-40 Megawatts	Conventional Steam Boilers	300-1,200	27.5	23.6	50-60	—	101-111
50-100 Megawatts		1,250-2,500	23.0	17.6	50-60	—	91-101
100 up Megawatts		2,000-up	18.3	11.7	50-60	—	80-90

P.W.R. — Pressurized Water Reactor
B.W.R. — Boiling Water Reactor

(1) Exclusive of land, training, set up supervision and contractors' profits.

(2) Plant operating 80 percent of the time.

(3) Where fuel inventory cost is not shown it is included in capital charges.

Continued Growth in Bank Earnings

Despite sluggish business activity and the downward trend of interest rates in 1960, earnings of New England banks exceeded 1959.

Interest rates, though declining through the year, maintained an average level somewhat higher than in 1959. Higher interest earnings, coupled with increases in the volume of loans, resulted in a 10 percent increase in total earnings. Profits were further improved as expenses rose less than earnings and losses from securities sales were less than in 1959.

Commercial bank loan demands were high as 1960 began. Business sales and industrial production began to slacken in the year, but business loans declined less than usual in the early months.

Interest rate movements reversed the pattern of the year earlier, experiencing a gradual decline in contrast to 1959's gradual rise. The easing of economic activity in late winter and the shift to a lesser degree of monetary restraint brought rates down to the level of a year earlier. The prime business loan rate dropped from its postwar high of 5 to 4½ percent in August, following a reduction of the Federal Reserve discount rate by ½ percent in June and again in August to reach 3 percent.

All major categories of earnings rose in 1960, and earnings from some sources were up substantially. Interest on loans rose 13 percent, almost double the percentage increase in the volume of outstanding loans.

Interest received on securities rose slightly in 1960 despite a lower average level of holdings compared to 1959.

MEMBER BANKS STATEMENT OF CONDITION

(Amounts in Thousands of Dollars)

	Boston		Other First Dist. Banks	
	Dec. 31, 1960	Percent Change from Dec. 31, 1959	Dec. 31, 1960	Percent Change from Dec. 31, 1959
Total Assets	3,301,249	+ 5.9	6,004,046	+ 4.4
Total reserves, cash and balances	**797,872**	**+ 9.5**	**1,116,302**	**+ 3.4**
Total investments	**776,158**	**+ 6.5**	**1,906,075**	**- 0.5**
U. S. securities	646,996	+ 8.5	1,389,222	- 2.1
Other securities	129,162	- 2.3	516,853	+ 4.0
Total loans and discounts	**1,637,954**	**+ 2.4**	**2,866,180**	**+ 8.4**
Commercial and industrial loans	943,656	+ 2.6	965,669	+10.3
Real estate loans	131,729	+19.9	791,769	+ 5.0
Other loans to individuals	324,893	+ 9.1	893,287	+11.3
All other loans	279,267	-10.0	275,221	+ 3.5
Reserves for bad debt losses etc.	41,591	+ 7.5	59,766	+ 9.6
All other assets	**89,265**	**+43.8**	**115,489**	**+ 5.7**
Total liabilities and capital accounts	3,301,249	+ 5.9	6,004,046	+ 4.4
Liabilities	**2,960,881**	**+ 6.0**	**5,497,439**	**+ 4.3**
Demand deposits	2,614,645	+ 4.1	3,781,991	+ 2.1
Time deposits	234,002	+17.2	1,470,611	+ 6.5
All other liabilities	112,234	+37.4	244,835	+34.3
Capital accounts	**340,368**	**+ 4.7**	**506,607**	**+ 5.6**

MEMBER BANKS EARNINGS, EXPENSES AND PROFITS

(Amounts in Thousands of Dollars)

	Boston		Other First Dist. Banks	
	1960	Percent Change from 1959	1960	Percent Change from 1959
Earnings	**151,800**	**+10.1**	**276,239**	**+ 9.8**
Interest received on bonds and stocks	21,697	+ 3.2	54,347	+ 3.7
Interest received on discounts and loans	93,091	+13.9	168,865	+12.7
Service charges on deposit accounts	4,137	+ 2.8	22,410	+11.5
Trust department	19,527	+10.1	17,806	+ 9.3
All other income	13,348	- 0.5	12,811	- 1.0
Expenses	**75,996**	**+ 8.1**	**185,967**	**+ 7.6**
Salaries and wages	40,672	+ 7.3	80,539	+ 3.5
Interest paid on time	4,072	+ 9.7	35,396	+10.1
All other expenses	31,252	+ 8.9	70,032	+11.4
Net current earnings	**75,804**	**+12.2**	**90,273**	**+14.7**
Non-current transactions	-5,435	-66.2	-12,438	-55.6
Profit before income taxes	70,369	+36.7	77,835	+53.5
Taxes on income	38,361	+77.4	31,587	+89.4
Net Profits	**32,008**	**+ 7.2**	**46,248**	**+36.0**
Cash dividends on common stock	16,981	+12.8	22,628	+ 9.5

Total expenses rose by 8 percent, slightly more than the increase in 1959. Interest paid on time deposits was the fastest growing expense category, reflecting the rise in both deposit volume and in rates paid. The wage and salary increase was a result of increasing employment and wage rises.

The greater rise in earnings than expenses resulted in a rise in net current earnings of 12 percent at Boston banks and almost 15 percent at First District banks outside Boston. There were losses from sales of securities and other noncurrent transactions, but these were smaller than last year. Consequently, profits before taxes rose substantially.

Earning Assets

Total earning assets increased about 5 percent in 1960 as compared to a 1959 rise of 1 percent.

Business loans—Member banks outside Boston increased the volume of business loans by 10 percent while Boston banks showed a 3 percent rise. These rises reflected in part the comparative slowness in business borrowing at the end of 1959 resulting from the steel strike.

Real estate loans — Mortgage loans rose 20 percent at Boston but only 5 percent outside. Boston banks are heavily involved in "warehousing" loans for other institutional investors which causes these loans to fluctuate substantially.

Consumer loans — Other loans to individuals, mainly consumer instalment loans, rose 10 percent, slightly less than last year. Although there was a rise in the number of autos sold, the volume of automobile instalment credit did not keep pace because lower priced compact cars reduced the size of the average loan.

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Despite sluggish business activity and the downward trend of interest rates in 1960, earnings of New England banks exceeded 1959.

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Earnings	**151,800**	**+10.1**	**276,239**	**+ 9.8**
Interest received on bonds and stocks	21,697	+ 3.2	54,347	+ 3.7
Interest received on discounts and loans	93,091	+13.9	168,865	+12.7
Service charges on deposit accounts	4,137	+ 2.8	22,410	+11.5
Trust department	19,527	+10.1	17,806	+ 9.3
All other income	13,348	− 0.5	12,811	− 1.0
Expenses	**75,996**	**+ 8.1**	**185,967**	**+ 7.6**
Salaries and wages	40,672	+ 7.3	80,539	+ 3.5
Interest paid on time	4,072	+ 9.7	35,396	+10.1
All other expenses	31,252	+ 8.9	70,032	+11.4
Net current earnings	**75,804**	**+12.2**	**90,273**	**+14.7**
Non-current transactions	−5,435	−66.2	−12,438	−55.6
Profit before income taxes	70,369	+36.7	77,835	+53.5
Taxes on income	38,361	+77.4	31,587	+89.4
Net Profits	**32,008**	**+ 7.2**	**46,248**	**+36.0**
Cash dividends on common stock	16,981	+12.8	22,628	+ 9.5

Total expenses rose by 8 percent, slightly more than the increase in 1959. Interest paid on time deposits was the fastest growing expense category, reflecting the rise in both deposit volume and in rates paid. The wage and salary increase was a result of increasing employment and wage rises.

The greater rise in earnings than expenses resulted in a rise in net current earnings of 12 percent at Boston banks and almost 15 percent at First District banks outside Boston. There were losses from sales of securities and other noncurrent transactions, but these were smaller than last year. Consequently, profits before taxes rose substantially.

Earning Assets

Total earning assets increased about 5 percent in 1960 as compared to a 1959 rise of 1 percent.

Business loans—Member banks outside Boston increased the volume of business loans by 10 percent while Boston banks showed a 3 percent rise. These rises reflected in part the comparative slowness in business borrowing at the end of 1959 resulting from the steel strike.

Real estate loans — Mortgage loans rose 20 percent at Boston but only 5 percent outside. Boston banks are heavily involved in "warehousing" loans for other institutional investors which causes these loans to fluctuate substantially.

Consumer loans — Other loans to individuals, mainly consumer instalment loans, rose 10 percent, slightly less than last year. Although there was a rise in the number of autos sold, the volume of automobile instalment credit did not keep pace because lower priced compact cars reduced the size of the average loan.

Nuclear Energy in the Paper Industry

The glamour of nuclear energy has caused many persons to hope for a new industrial era in New England. The average New England utility and manufacturing plant pays about 50 percent more than the national average price for industrial fuel. If this competitive disadvantage were wiped out, new industries might be attracted to the region.

The fact seems to be, however, that nuclear energy will have little impact on New England's competitive position during the next decade. Utility officials doubt that electric power generated by nuclear reactors will be fully competitive for another five or ten years.

However, nuclear reactors are a definite possibility for large manufacturing plants using low temperature process steam. For example, the pulp and paper mills in northern New England, where fuel costs are 20 percent greater than in southern New England*, use great quantities of coal and oil; they operate 24 hours a day, seven days a week. Here, total cost per unit of output could be reduced by spreading the high overhead costs. As a result, the benefits of the low cost of nuclear fuel could be realized.

The cost comparison between nuclear and conventional steam production in the table is based upon private financing by a manufacturing firm. It is assumed that the average cost of capital (equity and debt financing) would be 15 percent, that a 7 percent per annum depreciation would be allowed, and that an amount equal to 3 percent of capital would be spent for business taxes and insurance. Thus the total "overhead" charge is 25 percent.

The table on this page clearly shows that with present day technology, private financing by a manufacturing firm and a nuclear reactor operating 80 percent of the year, process steam cannot now be produced economically by a nuclear plant. Overhead costs per megawatt of both the 20 and 40 megawatt reactors are clearly prohibitive. Only in the case of the 100 megawatt reactor are costs per unit of output low enough to be almost competitive.

However, a 100 megawatt reactor is much too large for any of the pulp and paper mills in New England. A plant processing 250 tons of pulp per day would require a reactor of 20 megawatt capacity, while one processing 1200 tons per day would use a 100 megawatt reactor. In New England a maximum of 10 such firms are large enough to utilize a 20 megawatt plant while only five could operate with a 40 megawatt reactor.

One of the major stumbling blocks for a nuclear reactor is the capital cost. Advances in technology may reduce construction costs, but this is not likely in the near future. It is possible, however, that the Federal government may wish to promote the development of nuclear technology by guaranteeing or granting direct loans for industrial reactors.

If the cost of money were reduced from 15 percent to 5 percent per annum and the optimistic assumption were made that the plant would operate 90 percent of the year, a nuclear reactor might well be competitive with a conventional steam boiler financed with private capital.

Thus, if the Federal government wished to further the development of nuclear energy by subsidizing the construction of a number of full scale industrial reactors, it could probably accomplish this at a lesser cost in northern New England than in almost any other part of the country.

This article is based largely on a report entitled *Nuclear Process Heat and the Paper Industry* written by Mr. Arun Joshi with the aid of a grant from the Federal Reserve Bank of Boston. Mr. Joshi is a former graduate student at the Massachusetts Institute of Technology. Single copies of the complete report can be obtained from the bank's research department.

* See: "Industrial Fuel Costs in New England," Part I, in the August 1957 *New England Business Review*.

COMPARATIVE COSTS OF NUCLEAR PROCESS STEAM AND CONVENTIONAL BOILER STEAM

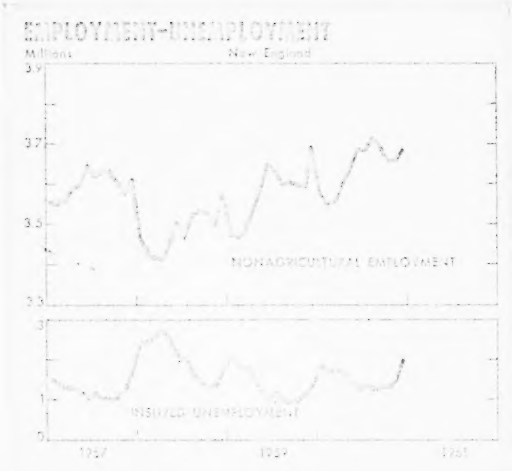
Reactor Size	Reactor Type	Total Direct Construction Costs (1) ($000)	Costs in cents/million B.T.U.				
			Overhead Charges	Operating Costs (2)	Fuel Costs	Fuel Inventory Costs (3)	Total Costs
20 Megawatts	P.W.R.	—	160	39	21	—	220
	B.W.R.	1,130-1,940	92	31	28	18	169
40 Megawatts	P.W.R.	2,486-2,763	72	17	20	13	122
	B.W.R.	2,226	64	17	28	36	145
100 Megawatts	P.W.R.	—	72	12	29	—	113
	B.W.R.	22,000	35	12	32	36	115
10-40 Megawatts	Conventional Steam Boilers	300-1,200	27.5	23.6	50-60	—	101-111
50-100 Megawatts		1,250-2,500	23.0	17.6	50-60	—	91-101
100 up Megawatts		2,000-up	18.3	11.7	50-60	—	80-90

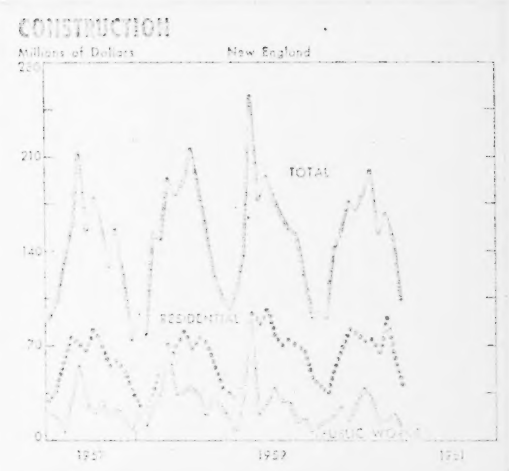
P.W.R. — Pressurized Water Reactor
B.W.R. — Boiling Water Reactor

(1) Exclusive of land, training, set up supervision and contractors' profits.

(2) Plant operating 80 percent of the time.

(3) Where fuel inventory cost is not shown it is included in capital charges.





MANUFACTURING INDEXES (seasonally adjusted)	MASSACHUSETTS (1950–52 = 100)			NEW ENGLAND (1950–52 = 100)			UNITED STATES (1957 = 100)		
	Jan. '61*	Dec. '60	Jan. '60	Jan. '61*	Dec. '60	Jan. '60	Jan. '61	Dec. '60	Jan. '60
All Manufacturing	113	111	116	111	110	117r	101	103	112
Primary Metals	99	90	108r	87	82	102r	72	70	115r
Textiles	39	38	46	59	57	66	n.a.	98	112
Shoes and Leather	119	117	109r	123	114	117r	n.a.	n.a.	106
Paper	101	97	109	124	117	132	n.a.	110	115
	*Preliminary			*Preliminary					

	NEW ENGLAND	Percent Change from:		UNITED STATES	Percent Change from:	
	Jan. '61	Dec. '60	Jan. '60	Jan. '61	Dec. '60	Jan. '60
BANKING AND CREDIT						
Commercial and Industrial Loans ($ millions) (Weekly Reporting Member Banks)	1,434	+ 1	+ 7	31,511	− 1	+ 5
Deposits ($ millions) (Weekly Reporting Member Banks)	4,575	0	+ 3	113,063	+ 1	+ 4
Check Payments ($ millions) (Selected Cities)	9,521	− 2	+ 9	247,660	− 4	+ 8
Consumer Installment Credit Outstanding (index, 1950–52 = 100)	266.4	+ 1	+12	287.8	− 1	+ 8
TRADE						
Department Store Sales (index, seas. adj. 1947–49 = 100)	126p	− 2	− 4	142e	− 3	− 3
Department Store Stocks (index, seas. adj. 1947–49 = 100)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
EMPLOYMENT, PRICES, MAN-HOURS, & EARNINGS						
Nonagricultural Employment (thousands)	3,618	− 3	+ 1	51,772	− 3	− 1
Insured Unemployment (thousands) (excl. R. R. and temporary programs)	234	+20	+29	3,293	+22	+49
Consumer Prices (index, 1947–49 = 100)	129.6 (Mass.)	0	+ 2	127.4	0	+ 2
Production-Worker Man-Hours (index, 1950 = 100)	82.9	+ 4	− 8	89.0	− 2	−11
Weekly Earnings in Manufacturing ($)	83.03 (Mass.)	+ 5	+ 1	89.55	0	− 3
OTHER INDICATORS						
Construction Contract Awards ($ thous.) (3-mos. moving averages Nov., Dec., Jan.)						
Total	121,531	−13	+20	2,696,294	− 9	+19
Residential	43,864	−31	−13	1,034,845	−12	+ 3
Public Works	17,908	+20	+66	567,067	−14	+51
Electrical Energy Production (index, seas. adj. 1947–49 = 100)*	229	+ 3	+10	281	+ 1	+ 5
Business Failures (number)	57	+36	− 8	1,404	+ 4	+19
New Business Incorporations (number)	793	−24	−22	16,554	+14	− 9

*Figure for last week of month

r = revised
n.a. = not available
e = estimate
p = preliminary